What is claimed is:

1. A plasma source comprising;

a plurality of metallic blocks;

a toroidal plasma chamber embedded in the metallic blocks, the toroidal plasma chamber including:

a gas inlet configured to receive a process gas;

a gas outlet configured to expel at least a portion of the process gas from the plasma chamber;

a plurality of linear channel segments, a plurality of joints, an inlet joint, and an outlet joint machined into the metallic blocks, each of the inlet joint, the outlet joint, and the plurality of joints connecting a pair of the linear channel segments, wherein (i) the linear channel segments, the joints, the inlet joint and the outlet joint in combination form the toroidal plasma chamber, (ii) the gas inlet is disposed on the inlet joint, (iii) the gas outlet is disposed on the outlet joint, and (iv) an inner angle of each of the joints is greater than about 90 degrees; and

a transformer substantially embedded in the metallic blocks, the transformer including:

a plurality of ferrite members embedded in the metallic blocks and encircling at least one linear channel segment of the toroidal plasma chamber; and

a plurality of primary windings positioned adjacent to an inner diameter of the toroidal plasma chamber.

2. The plasma source of claim 1, wherein the plurality of linear channel segments are at least six linear channel segments.

3. The plasma source of claim 2, wherein the plurality of metallic blocks are at least two metallic blocks.

4. The plasma source of claim 1, wherein the plurality of metallic blocks are aluminum blocks.

5. The plasma source of claim 1, further comprising a plurality of cooling plates, wherein each cooling plate is in physical contact with an outer surface of at least one of the metallic blocks to cool the plasma chamber and the transformer.

6. The plasma source of claim 5, wherein the cooling plates are at least partially embedded in the metallic blocks.

7. The plasma source of claim 1, wherein the gas inlet is the only inlet of the plasma chamber for receiving the process gas.

8. The plasma source of claim 1, wherein each metallic block includes (i) a portion of at least two linear channel segments and (ii) at least one of the plurality of joints, the inlet joint or the outlet joint connected to the at least two linear channel segments.

9. The plasma source of claim 1, wherein the metallic blocks are fixedly attached at multiple interfaces such that the linear channel segments embedded in the metallic blocks are aligned to form a toroidal plasma channel within the toroidal plasma chamber.

10. The plasma source of claim 9, further comprising a vacuum seal and a dielectric break at each of the interfaces.

11. The plasma source of claim 9, wherein each ferrite member is embedded at an interface, of the multiple interfaces, between a pair of the metallic blocks, the ferrite member being encased in a ferrite chamber formed by a pair of pockets machined into respective ones of the metallic blocks.

12. The plasma source of claim 11, wherein one or more of the primary windings are wrapped around a section of the ferrite member, the primary windings are substantially encased in the ferrite chamber formed by the corresponding pockets of the pair of metallic blocks at the interface.

13. The plasma source of claim 11, where the ferrite chamber is filled with a thermal interface material.

14. The plasma source of claim 1, wherein each ferrite member is molded as a unitary piece that includes a rounded annulus section and a trapezoidal section.

15. The plasma source of claim 14, wherein the rounded annulus section of each ferrite member is positioned adjacent to an outer diameter of the plasma chamber, and the trapezoidal section of each ferrite member is positioned adjacent to the inner diameter of the plasma chamber, a portion of the trapezoidal section has one or more of the primary windings wrapped thereto.

16. A method for manufacturing a plasma source, the method comprising;

providing a plurality of metallic blocks;

forming an embedded toroidal plasma chamber within the metallic blocks comprising:

drilling a plurality of linear channel segments, a plurality of joints, an inlet joint and an outlet joint into the metallic blocks, each joint, inlet joint and outlet joint connecting a pair of the linear channel segments;

disposing a gas inlet on the inlet joint;

disposing a gas outlet on the outlet joint;

forming each of the plurality of joints to create an inner angle of greater than about 90 degrees; and

assembling the metallic blocks such that the linear channel segments embedded in the respective metallic blocks are aligned to form a toroidal plasma channel within the toroidal plasma chamber; and

forming a transformer into the metallic blocks by embedding a plurality of ferrite members within the metallic blocks and wrapping one or more primary windings around a section of each ferrite member.

17. The method of claim 16, wherein the gas inlet is the only inlet of the plasma chamber for receiving a process gas.

18. The method of claim 16, wherein each metallic block includes (i) a portion of at least two linear channel segments and (ii) at least one of the joints, the inlet joint or the outlet joint connecting the at least two linear channel segments.

19. The method of claim 16, wherein assembling the metallic blocks comprises fixedly attaching the metallic blocks at multiple interfaces to form the toroidal plasma chamber.

20. The method of claim 16, wherein each of the plurality of ferrite members is embedded in the metallic blocks at the multiple interfaces, each ferrite member encircling at least one linear channel segment of the plasma chamber.

21. The method of claim 20, wherein embedding a plurality of ferrite members into the metallic blocks comprises encasing each ferrite member in a ferrite chamber formed by a pair of pockets machined into respective ones of the metallic blocks at the corresponding interface.

22. The method of claim 21, further comprising:

encasing the one or more primary windings of each ferrite member in the corresponding ferrite chamber;

locating the one or more primary windings adjacent to an inner diameter of the plasma chamber; and

filling the ferrite chamber with a thermal interface material.

23. The method of claim 20, further comprising molding each ferrite member as a unitary piece including a rounded annulus section and a trapezoidal section, the annulus section adapted to be positioned adjacent to an outer diameter of the plasma chamber, and the trapezoidal section adapted to be positioned adjacent to the inner diameter of the plasma chamber, a portion of the trapezoidal section has the primary windings wrapped thereto.

24. The method of claim 20, further comprising coupling a plurality of cooling plates to the metallic blocks such that each cooling plate is at least partially embedded in the metallic blocks.

25. The method of claim 24, wherein each cooling plate is in physical contact with an outer surface of at least one of the metallic blocks to cool the plasma chamber and the transformer.

26. The method of claim 19, further comprising forming a vacuum seal and a dielectric break at each of the interfaces.